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*Preliminary Note on the Occurrence of Microsporangia in Organic Connection with the Foliage of *Lyginodendron*.*

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(PLATE 6.)

Any certain knowledge at present possessed of the fructification of the *Pteridospermeæ** is restricted to the female organ or seed. Suggestions have been made that the microsporangia of *Lyginodendron Oldhamium*, the *Sphenopteris Höninghausi* of Brongniart, might be found in *Telangium Scotti*,† but the evidence for this was chiefly its association with fragments of *Lyginodendron Oldhamium*. From the structure of *Telangium Scotti*, I am satisfied that it cannot be the microsporangia of *Sphenopteris Höninghausi*, and in any case the organic connection was not demonstrated.

Among some specimens from the 10-foot ironstone measures (Westphalian, series), Coseley, near Dudley, sent me for examination by Mr. H. W. Hughes, F.G.S., were a number of examples of *Sphenopteris Höninghausi* preserved in small nodules.

Many of these were fragments of barren pinnæ, but a few showed a fructification referable to *Crossotheca*, Zeiller,‡ in organic connection with barren foliage of *Sphenopteris Höninghausi*, while other specimens consisted of fertile pinnæ or portions of pinnæ unassociated with any barren pinnules. Their identity with the fertile pinnules found in connection with sterile ones, leaves no doubt as to their also belonging to *Sphenopteris Höninghausi*.

I do not propose to enter into a detailed account of the structure of the

* Oliver and Scott, "On the Structure of the Palæozoic Seed *Lagenostoma Lomaxi*, etc.," 'Phil. Trans.,' ser. B, vol. 197, p. 239, 1904.

† M. Benson, *Telangium Scotti*, a new species of *Telangium (Calymmatotheca)*, showing structure, 'Ann. of Botany,' vol. 18, p. 161, Pl. 11, 1904.

‡ *Crossotheca*, Zeiller, 'Ann. d. Sc. Nat., 6^e sér., Bot.,' vol. 16, p. 180, Pl. 9, figs. 1—9, Aug., 1883, "Flore foss. Bassin houiller d. Valenciennes," p. 33, fig. 21, 1888.

Microsporangia of *Sphenopteris (Crossotheca) Höninghausi* (= *Lyginodendron Oldhamium*) in the present note, but merely wish to record the organic connection observed, and to give a brief description of their chief features. Their full description will be reserved for another communication.

The fertile pinnule is oval, entire, and attached to the rachis by a stout pedicel, which thickens very slightly upwards before merging into the pinnule, to the upper surface of which it appears to be united for a short distance. The pinnules seem to have been thick in substance, and the vascular trace enters it from the pedicel a short distance from the margin, where it immediately divides into two main branches which separate slightly from each other. Lateral veinlets probably existed, but they have not been observed in the fertile pinnules of *Sphenopteris (Crossotheca) Höninghausi*, though indications of their presence are clearly seen in the fertile pinnules of a closely allied but undescribed species.

Each fertile lobe bore six to eight broadly lanceolate sharply-pointed microsporangia. In the early condition the sporangia are bent inwards, and form a small hemispherical bunch with their apices meeting in the centre. At maturity the sporangia spread outwards, when they appear as a fringe hanging from the margin of the fertile pinnule, but are in reality connected for some distance to its lower surface. The microsporangia are bilocular, the parallel loculi being only separated by a narrow band of tissue. Dehiscence took place by a longitudinal cleft which passes down the inner surface of the sporangium in the line of the dividing wall of the two loculi.

Many of the sporangia still retain the microspores, which are easily removed for microscopical examination. They are circular or slightly oval, and measure 50 μ to 57 μ in diameter. Their outer surface is granular, from the presence of very minute blunt points, and is also provided with a triradial ridge, which, however, is seldom clearly seen on account of the cell wall being crumpled into ridges—probably the result of contraction.

A few examples of *Crossotheca Höninghausi* are figured on the accompanying Plate, after photographs by the author. Fig. 1 shows a fragment of a barren pinna, enlarged two times, to illustrate the pinnule cutting of the species. A specimen showing the *Crossotheca* fructification in organic connection with the barren pinnules, enlarged two times, is given at figs. 2 and 3. These two figures show the impression of the plant on the two surfaces of the split nodule. All the lateral pinnae show some fertile pinnules on their upper portions, while sterile ultimate pinnae are seen at the base of the penultimate pinnae. These are especially well seen at *c* and *d*, but sterile pinnules also occur on *b*, and at the apex of the specimen.

A small fertile pinna is given natural size at fig. 4, and the same specimen is enlarged two times at fig. 5, where the arrangement of the microsporangia is clearly exhibited.

My thanks are due to Mr. H. W. Hughes, F.G.S., to whom I have been so often indebted in the past for assistance in my studies of the Carboniferous Flora, for the opportunity of describing these interesting specimens.

On the Efferent Relationship of the Optic Thalamus and Deiter's Nucleus to the Spinal Cord, with special reference to the Cerebellar Influx Theory (Hughlings Jackson) and the Genesis of Decerebrate Rigidity (Sherrington).

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In the following experiments it was determined to re-investigate the matter of the thalamo-spinal mechanism from the point of view of tracing the relations of the thalamus to the mesencephalon and hind-brain.

Now, the thalamic grey centres are in association with the bulb and cord by the thalamo-bulbar and spinal tracts, placed on and around which are the rubro-spinal, tecto-spinal, Deiter-spinal, and the lateral cerebello pontine tracts. As the pyramidal fibres run through the mesencephalon it became necessary to exclude them in arranging the investigation.

The general methods employed were as follows:—

A. The localisation of the genesis of decerebrate rigidity and the influence of the cerebellum were determined by making successive coronal sections through the thalamus, mesencephalon pons, and bulb.

B. Excitation of the superior and middle cerebellar peduncles in normal animals and in others in which the pyramidal tracts had been previously degenerated by suitable lesions in the middle zone of the cerebral hemispheres.

C. Excitation of the cut surface of the thalamus and mesencephalon with or without previous pyramidal degeneration.

The experiments were all performed under complete anaesthesia, the anaesthetics used being chloroform or ether. In cases where the brain was